

“Lord Willing n’ the Creek Don’t Rise”

Flood Sustainability at Harpers Ferry National Historical Park

Located at the confluence of the Potomac and Shenandoah Rivers, Harpers Ferry, West Virginia, has a long history of flood activity. Since Anglo-European settlers first arrived in the area over 250 years ago, Harpers Ferry has averaged approximately one significant flood event per decade. Particularly noteworthy was 1996, because two of the six largest floods ever recorded in Harpers Ferry occurred within eight months. This article will provide an overview of some of the efforts undertaken by Harpers Ferry National Historical Park to enhance resource sustainability in the aftermath of the 1996 floods.

No effort to minimize flood damage will succeed without planning that takes place long before the water begins to rise. In the case of Harpers Ferry NHP, the park has produced a plan that documents the order in which park buildings will be impacted by rising water. This enables the park staff to prioritize efforts to evac-

uate buildings when flood warnings are posted. Furthermore, it is also essential to have disaster plans that include detailed building evacuation procedures in the event of an emergency. Such plans will highlight valuable artifacts that should be evacuated first, while also indicating artifacts whose material composition will allow them to remain in place during a flood. In emergency situations, knowing when to leave something behind can be almost as important as knowing when to move a priceless object. Finally, the procedures outlined in the plan should periodically be reinforced through practice sessions involving all the park staff.

Planning decisions made in advance helped Harpers Ferry NHP to recover quickly from the two 1996 floods. For example, park superintendent Don Campbell had designated all basements in the flood zone as “no storage” areas. This message was reinforced with a warning stenciled on basement floors in florescent orange paint. Strict enforcement of this rule enabled evacuation efforts to immediately focus on imperiled artifacts, rather than having to empty basements littered with an accumulation of items waiting to be surplus.

Prior planning also led to the decision to incorporate ground-level hatches into the floors of many buildings in the flood plain. After flood waters subsided, the hatches were opened and the lingering “flood mud” was swept into the basements. This accelerated the recovery by allowing the water and mud to be quickly pumped out of basements during the clean-up process.

After the 1996 floods, the wooden doors in the park’s historic buildings absorbed so much water that they became swollen and difficult to close, especially during humid weather. In the course of the flood recovery process, many of these doors were replaced with new ones made of water-resistant woods like western red cedar, white pine, and mahogany. Although these mate-

Museum exhibit case ready to be wheeled from building after removal of decorative base plate. Photo by the author.



Left, Virginius Island water intake arch in jeopardy of collapse after losing its structural load, photo courtesy NPS. Right, same arch following stabilization work completed during 1996 flood recovery program, photo by the author.



rials can be costly, they will save money in the long term by standing up to total water immersion without losing their shape.

The park's Virginius Island section presented some unique challenges following the 1996 floods. In the mid-19th century, Virginius Island had been the site of a small water-powered industrial community. During the past century and a half, the manufacturing concerns had gradually declined due to the transition to steam power, the devastation wrought by the Civil War, and the ravages of repeated flood episodes. Even before the 1996 floods, the built environment on Virginius Island had been reduced to a ruinous condition. The historic character of the island was in jeopardy of being completely lost as the area gradually returned to a "natural" state. The September 1996 flood was especially hard on the island and made it clear that intervention was required if the park hoped to continue interpreting this area's industrial heritage to the visiting public.

During the 19th century, a series of water intake channels was instrumental in directing water from the Shenandoah River into tunnels leading to the small factories on Virginius Island. Prior to the 1996 floods, the water intake arches were close to collapsing, the tunnels had been completely filled with silt and other flood debris, and the foundations of historic mill buildings had deteriorated to the point where their total loss had become a realistic possibility. The funding provided by Congress following the 1996 floods made it possible to reopen the tunnels and stabilize the arches and foundations. These steps have ensured that the water distribution system will be visible to the public and incorporated into the park's interpretive programs for decades to come.

Some of the most innovative advances in flood sustainability at Harpers Ferry NHP have been in the area of museum exhibit design. The exhibit titled *Harpers Ferry: A Place in Time* provides the best examples of these innovations. Developed through contracts managed by Harpers Ferry Center and the park, the building housing the exhibit was known to be in the flood plain from the very start of the planning process. When the initial installation of this exhibit was interrupted by the January 1996 flood, the urgency of flood sustainability became even more apparent.

Several steps were taken to protect this exhibit from future flooding. A simple, but important decision involved placing an emergency tool kit in a locked closet in the exhibit. Many specialized tools are needed to disassemble and evacuate a museum exhibit. When a disaster strikes, there is no time to spend searching for particular tools. The tool kit is conveniently located in the exhibit space to ensure that precious minutes are not wasted at the start of the evacuation process.

Like many modern exhibits, *Harpers Ferry: A Place in Time*, makes extensive use of computer technologies. There are several components of the exhibit that rely on interactive touchscreen displays. While the screens themselves must be located in the exhibit space, cabling was run through conduits to computers strategically located safely above historic high water levels on the upper floors of the building. The screens themselves are attached to lightweight stands that can easily be evacuated from the exhibit and moved to higher ground. Such safeguards will minimize damage to expensive computer hardware and expedite the reopening of the exhibit after flooding occurs.

Another innovation in this exhibit involves the design of exhibit cases. Several of the cases sit on wheels that remain hidden behind decorative panels seen by the visiting public. In the event of a flood, these panels can be unlocked and removed, thereby allowing the cases to be wheeled to a truck and transported to higher ground for safe keeping.

Other important lessons can be briefly outlined. The importance of a seasoned staff with previous flood experience can not be overestimated. It is also critical to be in contact with the National Weather Service and the U.S. Geological Survey for the latest rain and river crest forecasts. Once the water begins to rise, staff must be prepared to work fast in extreme climatic conditions to prevent debris from clumping into log-jams that can be destructive to buildings and other resources. Quick action after the flood is also essential in order to begin pumping flood mud when it is still in suspension, thus saving weeks of effort needed to shovel hardened mud out of basements. Finally, it is important to create a manifest during the evacuation phase so that items can be easily located during the weeks or months when the recovery process is underway.

The examples cited in this article represent only a small percentage of the flood sustainability measures implemented at Harpers Ferry NHP. While no flood can be reasonably expected to leave park resources completely unharmed, valuable steps have been taken to ensure that the extent of the damage is minimized and that the park can be reopened to the public in the shortest possible time. The lessons learned by the staff have provided clear benefits to the cause of resource preservation and can serve as a model to

historic sites in flood prone areas across the United States and around the world.

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Left, water tunnels on Virginius Island nearly filled with flood debris, photo courtesy NPS. Right, same tunnels with debris removed as part of the 1996 flood recovery program, photo by the author.

